



TACOM

TACTICAL FUZE DESIGN FOR THE XM984 DPICM MORTAR CARTRIDGE



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**PRESENTED BY:
JOHN YOO, SR. PROJECT MGR.**



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BT Fuze Products Division

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San Antonio, TX
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NDIA Event# 2560



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TACTICAL FUZE DESIGN FOR THE XM984 DPICM MORTAR CARTRIDGE



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XM984 DPICM

- ☐ 120 MM MORTAR CARTRIDGE
- ☐ ROCKET ASSISTED ROUND
 - ☐ FIRING RANGE EXTENDED TO 11 KM
- ☐ GENERICALLY CONFIGURED CARTRIDGE
 - ☐ CARGO: SMOKE, ILLUMINATION, COUNTERMEASURE
 - ☐ PAYLOAD: DP SUBMUNITIONS W/SELF-DESTRUCT FUZING



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XM984 DPICM UTILIZES ENHANCED TECHNOLOGIES

- ☐ **COMPOSITE STRUCTURAL MATERIAL**
 - ☐ **OGIVE & CENTER CARGO BODY**
 - ☐ **TAILBOOM & BASE**
 - ☐ **FIN ASSEMBLY**
- ☐ **TRACTOR TYPE ROCKET MOTOR**
 - ☐ **FLIGHT STABILITY**
 - ☐ **SIMPLIFIES CARTRIDGE DESIGN**
- ☐ **MUZZLE EXIT VELOCITY SENSOR (VMRI)**
 - ☐ **PRECISION DELIVERY (REDUCED CEP)**
 - ☐ **CAN BE USED AS SECOND SAFETY (NON-SPIN ROUND)**
- ☐ **MULTI-FUNCTION FUZE**
 - ☐ **EMBEDDED DUAL FUNCTION FUZE**
 - ☐ **ELECTRONIC TIME FUZE**
 - ☐ **TWO INDEPENDENT SAFETY FEATURES**



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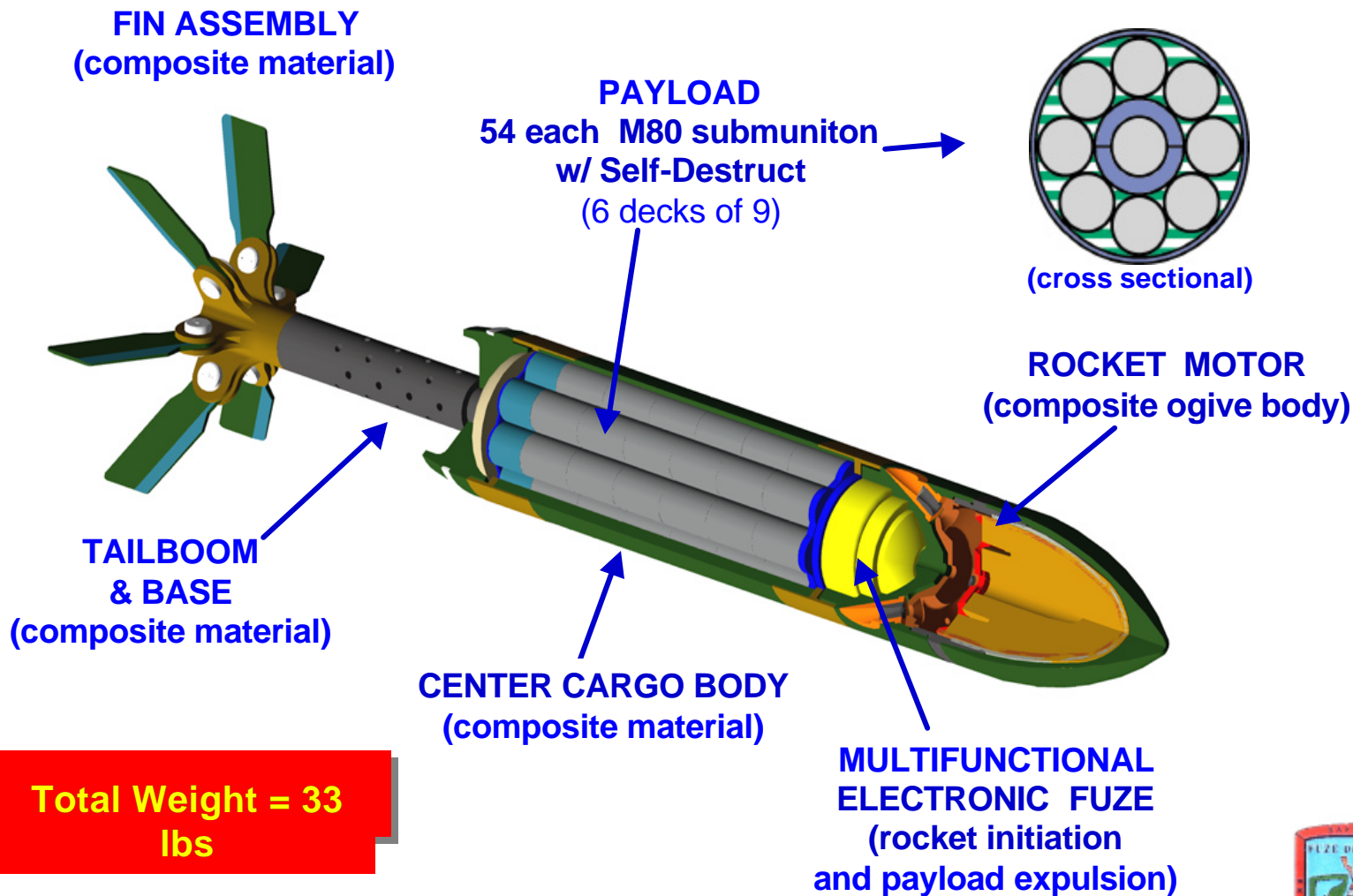


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UNIQUE TACTICAL FUZE DESIGN FEATURES

- ☐ **EMBEDDED DUAL FUNCTION FUZE**
 - ☐ **LOCATED BETWEEN ROCKET MOTOR AND PAYLOAD**
 - ☐ **IGNITES ROCKET AND INITIATES EXPULSION CHARGE**

- ☐ **ELECTRONIC TIME MORTAR FUZE**
 - ☐ **SETTABLE IN MANUAL AND REMOTE MANNER**
 - ☐ **PRECISION TIMING AND FUNCTION RELIABILITY**
 - ☐ **VMRI INTERFACE**

- ☐ **TWO INDEPENDENT SAFETY FEATURES**
 - ☐ **SATISFIES MIL-STD-1316 REQUIREMENTS**
 - ☐ **FIRST SAFETY - SETBACK**
 - ☐ **SECOND SAFETY – SEQUENTIAL SPIN & SETBACK**
 - ☐ **OPTIONAL - VMRI**



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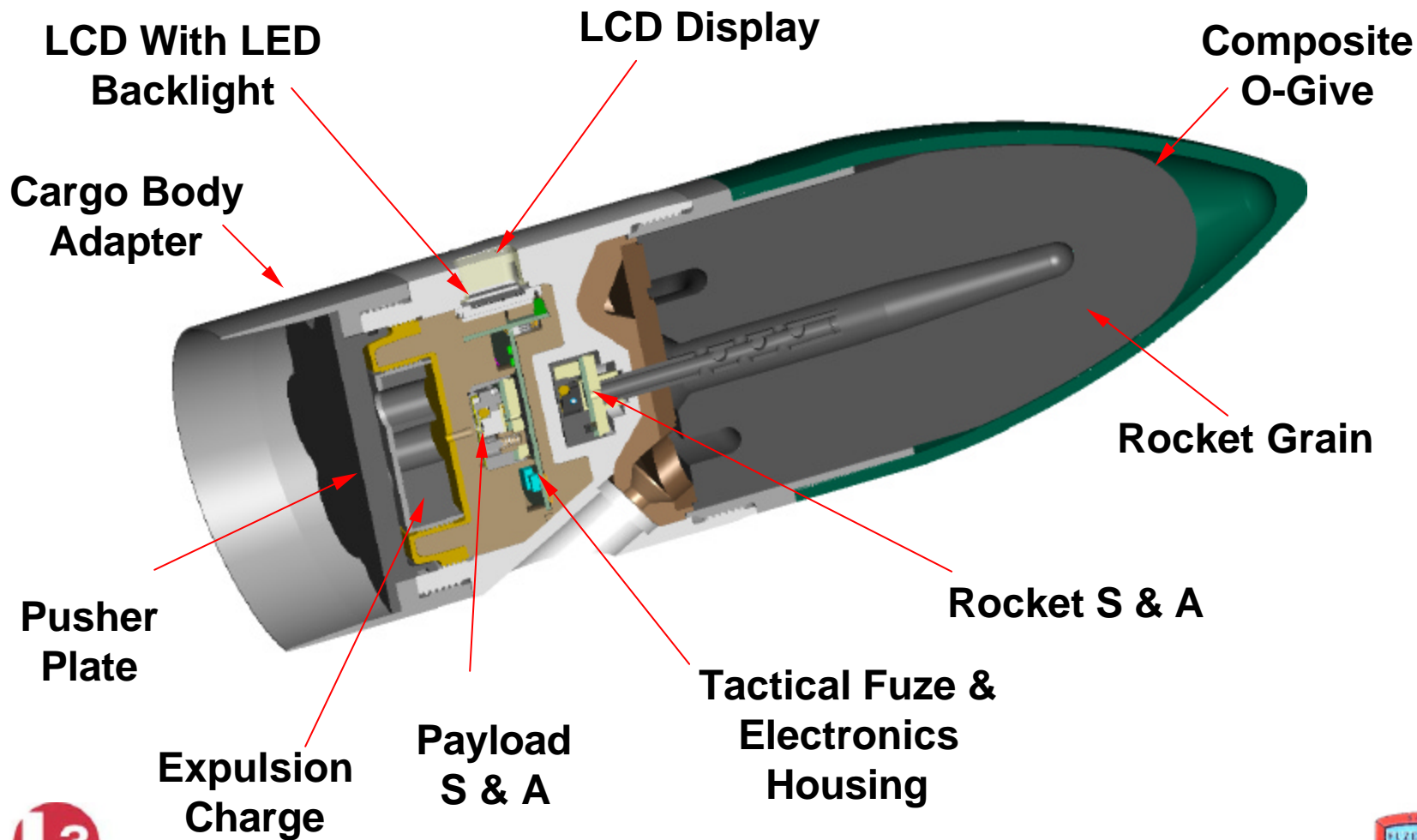


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DESIGN CHALLENGES & SOLUTIONS

EMBEDDED CONFIGURATION:

	CHALLENGES	SOLUTIONS
MANUAL SETTING	BATTERY ACTIVATION, FUZE SETTING & DISPLAY	BULKHEAD BECOMES PART OF FUZE ASSEMBLY
REMOTE SETTING	PHYSICAL MATCH	OPTION 1 - PLACE TRANSFER COIL INSIDE THE FUZE OPTION 2 – PLACE RECEIVER COIL INSIDE OGIVE



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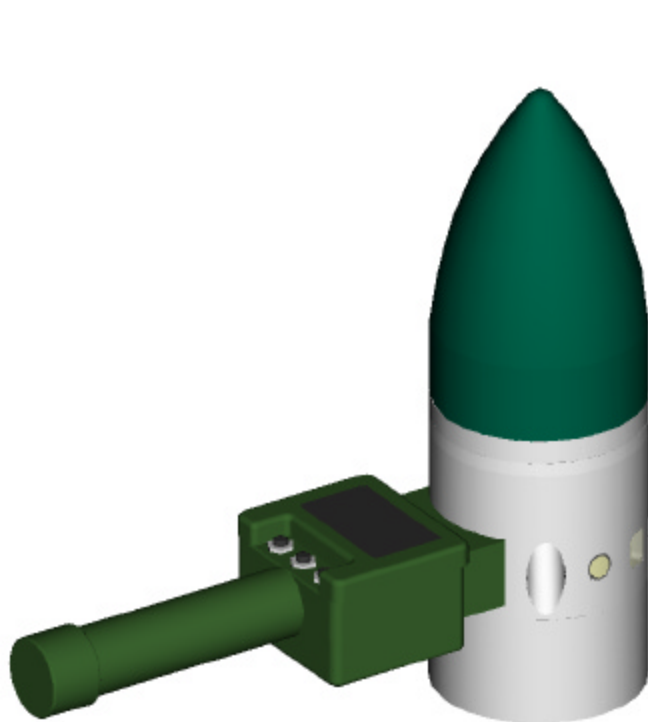


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SETTING FROM SIDE



SETTING FROM TOP



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DESIGN CHALLENGES & SOLUTIONS

DUAL FUNCTION:

	CHALLENGES	SOLUTIONS
PAYLOAD FUNCTION OCCURS SOMETIME AFTER ROCKET IGNITION	HEAT AND PRESSURE INSULATION FOR FUZE ELECTRONICS & ENERGETICS	ISOLATE ROCKET IGNITION S&A FROM REST OF THE FUZE MAKE CONNECTION TO FUZE ELECTRONICS USING FEEDTHRU COMPONENT



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DESIGN CHALLENGES & SOLUTIONS

ELECTRONIC TIME FUZE:

	CHALLENGES	SOLUTIONS
FIRE CONTROL INTERFACE	NO STANDARD EXIST FOR MORTAR APPLICATION	UTILIZE PIAFS FOR THE MESSAGE FORMAT AND MODIFY SETTER CONFIGURATION



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DESIGN CHALLENGES & SOLUTIONS

ELECTRONIC TIME FUZE:

	CHALLENGES	SOLUTIONS
TO PROVIDE TIMING & FIRING CONTROL USING NON- DEVELOPMENTAL ITEMS W/O COMPROMISING SAFETY	NO PRODUCTION PROVEN ELECTRONIC TIME MORTAR FUZE DESIGN IS AVAILABLE	UTILIZE M762A1 / M767A1 ARTILLERY ET FUZE <ul style="list-style-type: none">- > 99% BALLISTIC RELIABILITY- T&C ASIC W/PROVEN SAFETY ARCHITECTURE



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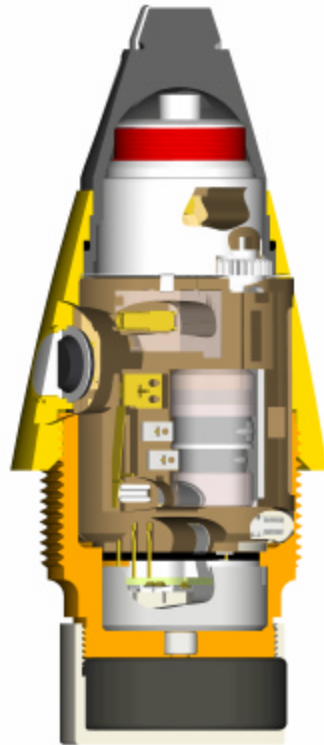
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THE XM984 DPICM MORTAR CARTRIDGE



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BALLISTIC PERFORMANCE (2001-2002)

	UNITS BUILT	TEST UNITS	NO. OF DUDS	% REL
M762A1/M767A1				
<input type="checkbox"/> FIRST ARTICLE	573	573	1	99.8
<input type="checkbox"/> PRODUCTION	248,480	709	1	99.9

M762A1/M767A1 ETAF



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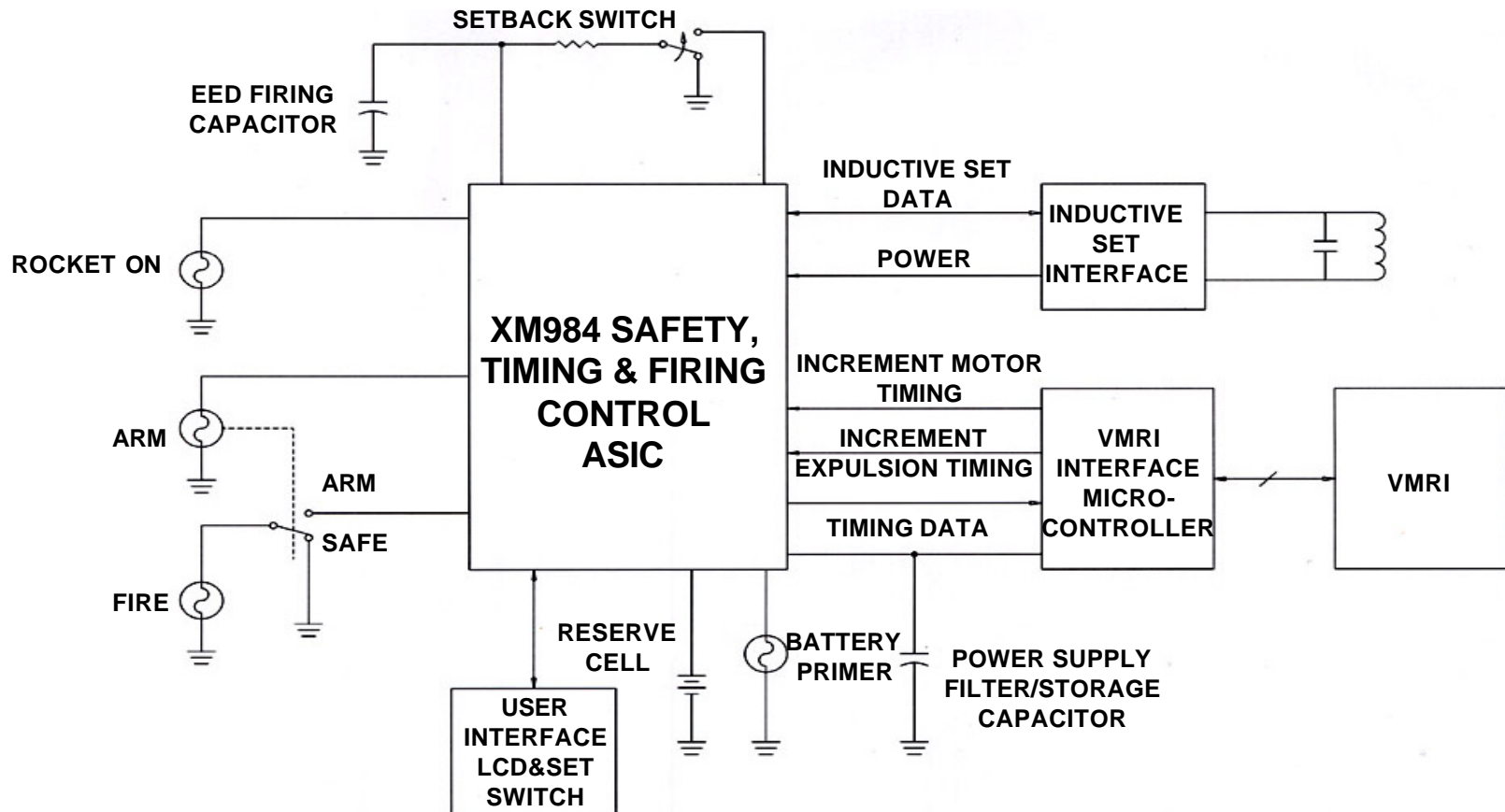


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XM984 FUZE CIRCUIT BLOCK DIAGRAM



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DESIGN CHALLENGES & SOLUTIONS

SECOND ENVIRONMENT SAFETY FEATURE:

	CHALLENGES	SOLUTIONS
TO PROVIDE 2 ND SAFETY FEATURE W/O SAFETY PULL WIRE	LIMITED SPIN FORCE IS AVAILABLE	OPTION 1 - MODIFIED THE M762A1/M767A1 S&A TO INCLUDE SEQUENTIAL SAFETY LOCK DESIGN OPTION 2 – UTILIZE VMRI



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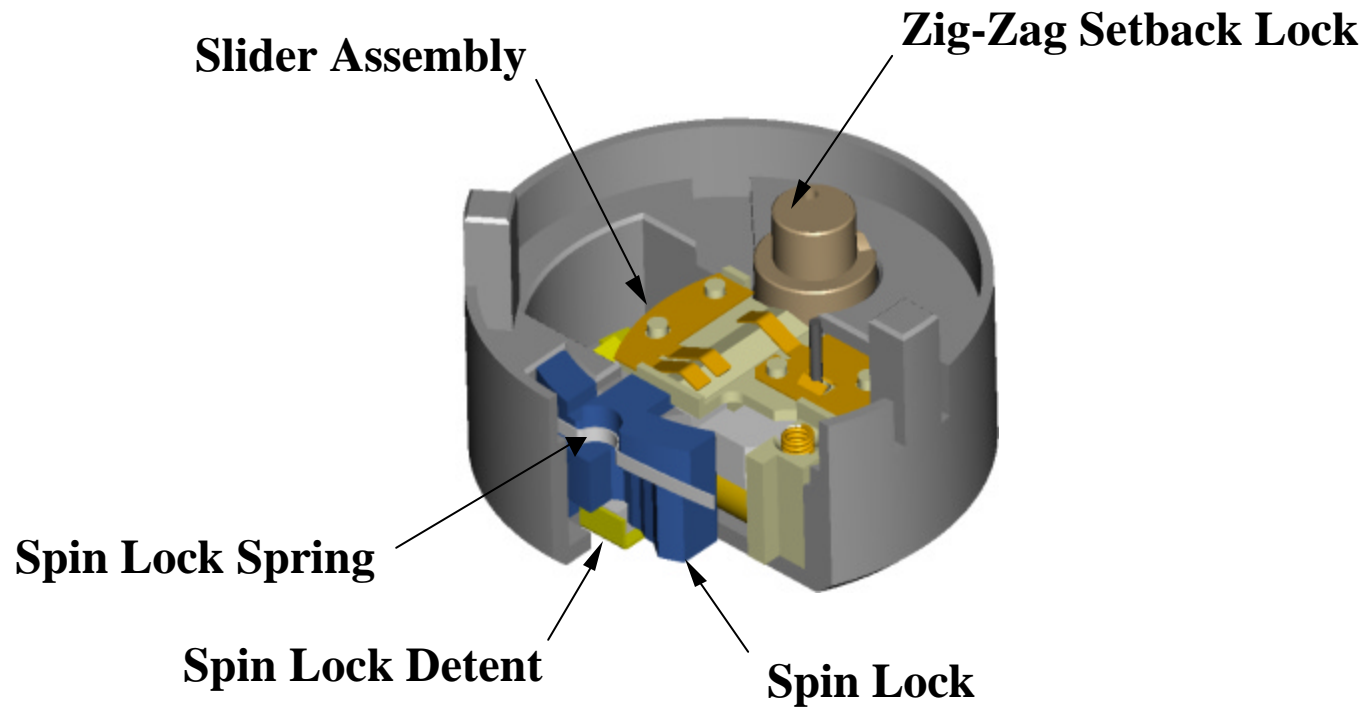


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Safe and Arm Device



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STATUS OF XM984 PROGRAM

- ☐ **ENGINEERING COMPONENT TEST**
 - ☐ **FLAT ANGLE LIVE FIRE TEST – 22 AUG 2001**
 - ☐ **STATIC ROCKET MOTOR TEST – 29 AUG 2001**
- ☐ **DESIGN OF MULTI-FUNCTION FUZE**
 - ☐ **COMPLETED PRELIMINARY TACTICAL FUZE DESIGN**
- ☐ **COMPOSITE OGIVE**
 - ☐ **FABRICATED PROTOTYPE COMPRESSION MOLD OGIVE**
- ☐ **SHORT RANGE FLIGHT DEMONSTRATION**
 - ☐ **BALLISTIC TESTING AT YPG - 08 OCT 2001**
 - ☐ **ALL TEST OBJECTIVES MET**
 - ☐ **COMPLETED STO EXIT CRITERIA**
- ☐ **TECHNOLOGY BASE PHASE COMPLETED IN FY01**
 - ☐ **CURRENTLY UNFUNDED**
 - ☐ **POTENTIAL FOR ACCELERATED CAD PROGRAM
TO MEET FCS FIELDING REQUIREMENT IN FY08**



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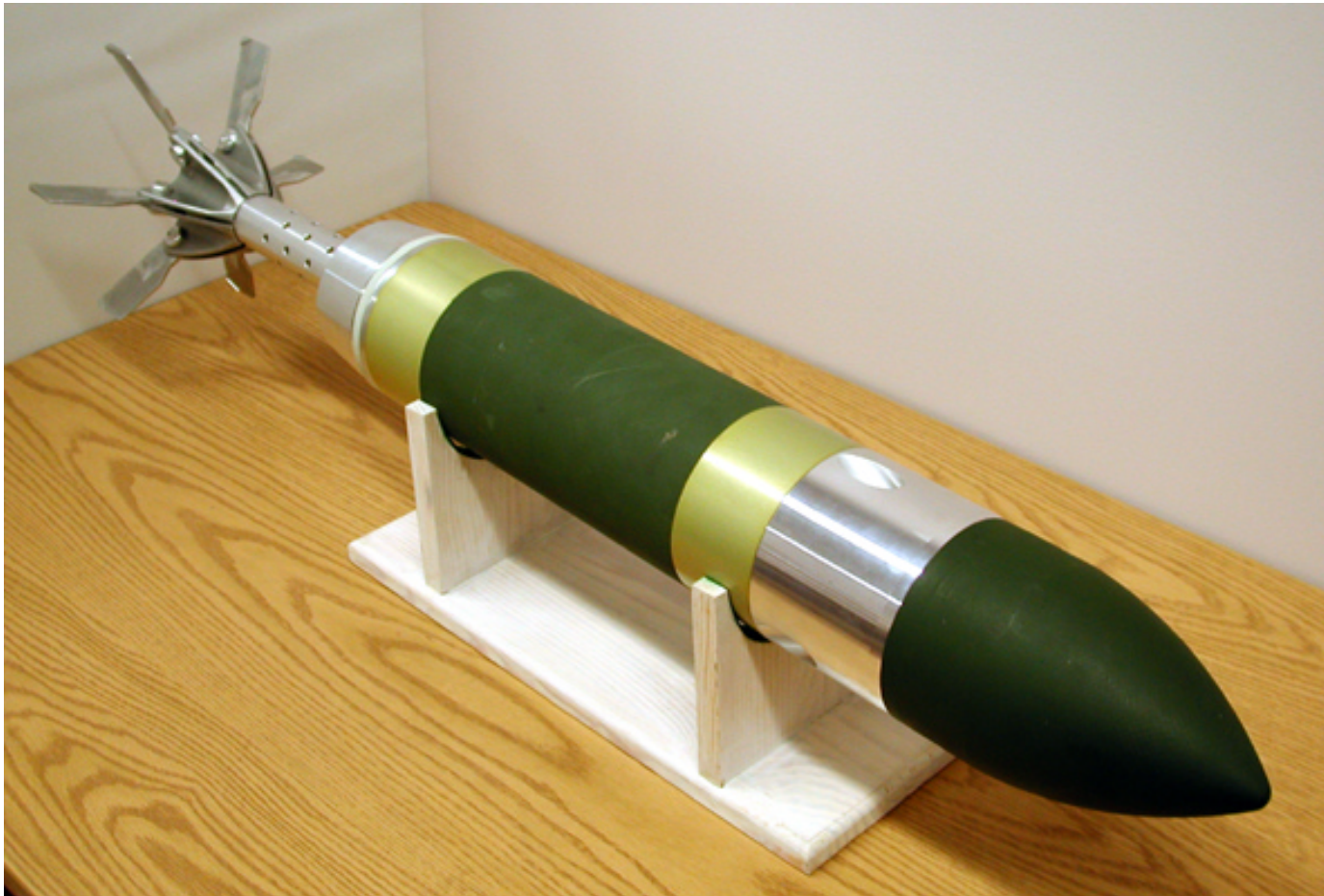


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PROGRAM TEAM

- ☐ **PROGRAM FUNDED THROUGH FSAC OF TACOM-ARDEC**
- ☐ **DEDICATED INDUSTRY/GOVERNMENT TEAM EFFORT**
 - ☐ **INDUSTRY TEAM LEADERS**
 - ☐ **BT FUZE PRODUCTS – TACTICAL FUZE**
 - ☐ **TALLEY DEFENSE – ROCKET & ENERGETICS**
 - ☐ **INTELLITEC – COMPOSITE CASE**
 - ☐ **CHAMBERLAIN – METAL PARTS**
 - ☐ **GOVERNMENT TEAM MEMBERS**
 - ☐ **FUZE DIVISION – TACTICAL FUZE**
 - ☐ **FSAC – XM984 DPICM PROGRAM DEVELOPMENT**
 - ☐ **PM MORTARS – OVERSIGHT MANAGER FOR REQ'S**
- ☐ **XM984 MANAGEMENT WILL BE TRANSITIONED TO PM MORTARS
FOR SYSTEM DEVELOPMENT & DEMONSTRATION PHASE**



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